



Turning Energy
Efficiency and Environmental
Performance Into a
Corporate Asset

Action Plan “First Tier” Checklist

Boilers

- Optimize boiler size and boiler loading
- Analyze flue gas and optimize air-to-fuel ratio
- Install over-fire draft control
- Convert to atomizing burners
- Install characterizable fuel valve
- Clean boiler tube
- Establish burner maintenance schedule
- Install stack dampers
- Recover waste heat from flue gas or blowdown to pre-heat combustion air or pre-heat feedwater
- Minimize boiler blowdown with better feedwater treatment
- Automate blowdown control
- Turn off hot water circulation pump when boilers are not in use
- Fuel-switch to less carbon-intensive fuel

Steam Systems

- Implement steam trap maintenance program
- Shut off steam traps on super-heated steam lines when not in use
- Install correctly sized steam traps
- Repair steam leaks in lines, valves and reducing stations
- Improve insulation of steam lines, condensate lines, and condensate tanks
- Recover and recompress vented steam for low-pressure applications
- Flash condensate to produce lower pressure steam
- Increase condensate return to boiler
- Install de-aerator in place of condensate tank
- Replace barometric condensers with surface condensers
- Clean steam coils in process tanks
- Close off unused steam lines
- Use minimum steam operating pressure

Furnaces, Ovens, and Kilns

- Minimize warm-up time and temperature
Use optimum temperature and minimum safe ventilation
- Automate controls
- Recover waste heat for use in other applications
- Optimize combustion and heat transfer conditions
- Improve insulation, seals, and refractories
- Implement direct firing or direct electric heating in place of indirect heating

Waste Heat Recovery and Heat Containment

- Recover waste heat for use in other applications
- Clean fouled heat-exchanger surfaces (filter contaminated streams if fouling is heavy)
- Install or improve equipment insulation
- Isolate hot equipment from air-conditioned areas

Cogeneration and Renewables

- Install cogeneration equipment
- Generate electricity with waste heat
- Generate electricity with renewable resources (e.g., biomass, photovoltaics, wind turbines)

Process Cooling

- Use cooling tower water instead of refrigeration or chiller
- Use outside air when possible
- Reduce refrigeration system operating pressure
- Raise cooling water temperature
- Use waste heat for absorption refrigeration
- Clean condensers and coils
- Improve insulation
- Use continuous freezing in place of batch freezing

Compressed Air Systems

- Use cooler air for compressor intakes
- Install, upgrade or adjust compressor controls
- Right-size compressors/optimize loading
- Reduce pressure
- Eliminate compressed air use
- Repair air leaks
- Recover waste heat
- Change dryer filters
- Clean intercoolers
- Adjust operating schedules to minimize equipment idle time
- Remove or close off unused compressed air lines

Process Controls

- Optimize temperature, pressure, flow, and material movement
- Install automated systems

Other Technologies

- Next generation technologies:
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The Climate Wise Opportunity Assessment “Quick Scan”

EFFICIENCY OPPORTUNITY	1=Not Very 2=Somewhat 3=Very	PERFORMANCE RATING	PRIORITY SCORE Column 1 x Column 2	Yes, if Priority Score ≥
Energy Efficiency <input type="checkbox"/> Furnaces/Boilers <input type="checkbox"/> Steam Systems <input type="checkbox"/> Process Equipment <input type="checkbox"/> Motors/Drives <input type="checkbox"/> Compressed Air Systems <input type="checkbox"/> Lighting <input type="checkbox"/> HVAC/Building Shell				
Hazardous Waste Prevention <input type="checkbox"/> Cleaning Processes <input type="checkbox"/> Operating and Production Practices <input type="checkbox"/> Inventory Control <input type="checkbox"/> Painting/Coating Operations <input type="checkbox"/> Landscaping				
Transportation Efficiency <input type="checkbox"/> Alternative Work Schedules <input type="checkbox"/> Public Transportation <input type="checkbox"/> Car Pools/Van Pools/Clean Fuel Vehicles <input type="checkbox"/> Telecommuting <input type="checkbox"/> Biking/Walking				
Water Efficiency <input type="checkbox"/> Building/Plant Maintenance <input type="checkbox"/> Sanitary Use <input type="checkbox"/> Cooling and Heating Systems <input type="checkbox"/> Process Operations <input type="checkbox"/> Landscaping				
Solid Waste Reduction (Reduce, Reuse, Recycle) <input type="checkbox"/> Production Operations <input type="checkbox"/> Packaging <input type="checkbox"/> Equipment <input type="checkbox"/> Office Paper <input type="checkbox"/> Organic Waste				
Green Product Design <input type="checkbox"/> Suppliers are environmentally sound <input type="checkbox"/> Products are designed to minimize waste and pollution <input type="checkbox"/> Products can be reused/recycled after use <input type="checkbox"/> Environmental factors are incorporated in product design				
Green Management Practices <input type="checkbox"/> Interdepartmental environmental team <input type="checkbox"/> Environmental goal setting process <input type="checkbox"/> Environmental impacts considered in investment decisions, accounting, and personnel policy <input type="checkbox"/> Adopts “best environmental practices” used in industry				